

Improving Internal Navy Allocation Decisions:

The Case of Military Manpower

Alan J. Marcus

19990429 037

Center for Naval Analyses

4401 Ford Avenue • Alexandria, Virginia 22302-1498

DISTRIBUTION STATEMENT A

Approved for Public Release

Distribution Unlimited

Approved for distribution:

A handwritten signature in black ink, appearing to read "Samuel D. Kleinman". The signature is fluid and cursive, with a horizontal line extending from the end.

Samuel D. Kleinman, Director
Infrastructure and Readiness Team
Support Planning and Management Division

This document represents the best opinion of CNA at the time of issue.
It does not necessarily represent the opinion of the Department of the Navy.

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

For copies of this document, call the CNA Document Control and Distribution Section (703) 8

Copyright © 1996 The CNA Corporation

REPORT DOCUMENTATION PAGEForm Approved
OMB No. 074-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE May 1996	3. REPORT TYPE AND DATES COVERED Final	
4. TITLE AND SUBTITLE Improving Internal Navy Allocation Decisions: The Case of Military Manpower			5. FUNDING NUMBERS C - N00014-91-C-0002	
6. AUTHOR(S) AJ Marcus				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Center for Naval Analyses 4401 Ford Avenue Alexandria, Virginia 22302-1498			8. PERFORMING ORGANIZATION REPORT NUMBER CRM 95-222.10	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Distribution unlimited				12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 Words) In a period of shrinking resource, the Navy is searching for ways to reduce the costs of operating and supporting its forces. Those savings can be used to help recapitalize the Navy as the turn of the century approaches. Past efforts at reducing support costs have often focused on outsourcing or privatizing work that can be done commercially. Evidence from past research indicates that savings are available from outsourcing work and from public-private competitions. The evidence indicates that the pressure of competition, among private sector firms and between government activities and the private sector, is the source of those savings. In the Program Objectives Memorandum (POM) process, resource sponsors pay a price for each billet they authorize. The Navy has begun to include more explicit personnel costs in the POM process. This paper considers the potential for how that cost information may improve manpower resource decisions and examines broader decision-making frameworks as well.				
14. SUBJECT TERMS billets (personnel) contracts, costs, decision making defense economics, manpower, military force levels, military personnel, outsourcing, reductions, requirements, salaries			15. NUMBER OF PAGES 32	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT	

Contents

Summary	1
Price information	2
Who decides?	3
Requirements determination	3
Recommendations	5
Pricing billets	7
Accounting for full costs	7
Accounting for differences across ratings and paygrades	8
Setting prices in an unconstrained environment . . .	9
Setting prices in a constrained environment	14
Who decides?	17
Alternatives	17
Conclusions.	19
Requirements determination	21
Recommendations.	25
References	27
Distribution list	29

Summary

In a period of shrinking resources, the Navy is searching for ways to reduce the costs of operating and supporting its forces. Those savings can be used to help recapitalize the Navy as the turn of the century approaches. Past efforts at reducing support costs have often focused on outsourcing or privatizing work that can be done commercially. Evidence from past research indicates that savings are available from outsourcing work and from public-private competitions [1, 2]. The evidence indicates that the pressure of competition, among private sector firms and between government activities and the private sector, is the source of those savings.

Some work, almost by definition, cannot be competed. In those cases, we'd like to be able to use lessons learned from the private sector to help increase the efficiency of internal Navy decision-making. In this paper, we offer some initial thoughts on how to make efficient resource allocation decisions about what may be the most inherently governmental of all resources—military manpower. In the POM process, resource sponsors pay a price for each billet they authorize. There are two types of problems with the billet prices used today. One is that they don't capture the full costs of supporting those billets. Adding a billet to an activity usually obligates the Navy to a whole series of costs not directly associated with the pay and allowances of that billet. The second is that billet prices don't distinguish among different types of personnel. Different personnel cost the Navy varying amounts based on paygrade and rating. These two problems affect the decision-making process in different ways, and we address the potential responses to them separately.

The Navy has begun to include more explicit personnel costs in the POM process. This paper considers the potential for how that cost information may improve manpower resource decisions and examines broader decision-making frameworks as well.

This paper is part of a larger research agenda that is examining decision-making processes to improve the Navy's internal efficiency. As part of this project, we have examined potential improvements to the Defense Business Operations Fund (DBOF) process [3]. In related analyses, we are examining resource decision processes in support of Navy training and family housing.

The keys to efficient decisions about military manpower rest on the ability of decision-makers to see the full and appropriate costs of employing military personnel and their ability to make choices between spending resources on personnel and other requirements and among different types of personnel. Good manpower cost information is necessary for good decision-making, but that information alone is not enough. Adopting better manpower price information while maintaining other constraints or using the wrong costs for other resources may limit improvement.

In this paper, we describe the perceived problems in allocating military personnel, identify the major problems, and outline approaches that will allow the Navy to move toward a better decision-making process.

Price information

Making the right choices about how many personnel and what types are optimal in deployable units (and ashore) requires information on the costs of those personnel. That cost information helps determine the appropriate tradeoffs between personnel and other resources and among different types of personnel. Comparing personnel to other resources requires that the full cost of personnel be visible. Adding a billet to an activity obligates the Navy as a whole to a series of costs not directly associated with that billet (e.g., recruiting, base support, housing, and medical, for example.) Those costs should be visible to decision-makers in the POM process. Choosing among different types of personnel (by paygrade and specialty) requires that the relative costs of each type of personnel be visible. Differences in pay and allowances can capture most of the cost differences by paygrade, but training and attrition costs need to be accounted for to compare personnel across ratings or designators.

Who decides?

Who decides how many and what type of personnel to authorize is not a clear cut question. There are two conflicting principles regarding this issue. One is that we ought to allow the broadest possible range of tradeoffs. That would argue for substitution of personnel (and other resources) among warfare communities. At its extreme, however, this principle leads to the CNO making all resource decisions. A second principle is that decision-makers at relatively low levels should be empowered to make decisions about how best to allocate their resources without interference from central management. This type of empowerment means that decisions are made that ignore the wide range of resource tradeoffs that are possible.

The current Navy system, which generally allows platform sponsors to make resource allocation decisions within their own communities, with input from senior headquarters leadership and fleet commanders, is a reasonable compromise. The Army and the Air Force allow their major commands (roughly the equivalent of the fleet commanders) to take the lead role in many resource decisions. Increasing the role of the fleet commanders in the allocation of manpower resources is a strategy the Navy may want to consider. This strategy, if pursued, should include responsibility for other resources as well.

Requirements determination

The manpower allocation process charges sponsors for the billets that they authorize. The cost of those billets is one influence on the number and type of billets they choose. It's not the only, and perhaps not the most important, influence. The billets that sponsors are allowed to buy for their ships, submarines, and aircraft squadrons are strictly limited by the billet requirements set for those platforms. Those requirements specify the number and

types of positions that can be authorized.¹ Generally, sponsors can't authorize more billets of any particular rating and paygrade than are listed in the requirements document.

The requirements guidelines limit the flexibility of sponsors to adjust manning authorizations to perceived changes in the cost of particular billets. As an extreme case, if a sponsor wanted to authorize 100 percent of the billet requirements, the only feasible solution is to buy exactly the billets listed in the requirements document. Any change in billet prices would have no effect on the mix of billets that could be bought. In practice, sponsors authorize around 90 percent of the required billets; this means that some choices can be made, but this flexibility is clearly limited.

Although the manpower requirements process has great influence over what billets are bought, it doesn't directly consider the costs of different types of personnel. The requirements determination process is generally an engineering exercise and isn't specifically designed to make good business decisions for the Navy.

The requirements process is systematic and reproducible. Previous CNA studies suggested ways to improve it [4], but, in general, the process is credible and serves as a starting point for deciding how to man ships and squadrons. The system tends to reproduce the current manning profile of ships because it is based on current practices. The original requirements are manipulated to ensure that they are consistent with current personnel rules. Relying on it too heavily, therefore, limits the Navy's responses to changes in economic conditions.

For example, if changes in private sector market conditions caused an increase in retention rates (and reduced the relative cost of senior personnel), a manager might want to increase the ratio of senior to junior personnel. In a period of downsizing, the Navy may want to reconsider its personnel mix. The current requirements process doesn't allow prices to influence the outcome.

1. The actual number and type of personnel assigned to the units is another variable. The personnel system responds imperfectly and slowly to changes in the authorizations. In the short-run, the personnel system can only supply what it currently has in inventory. Over time, it tries to make inventories and authorizations match.

The platform sponsors have some influence over requirements, but the changes are generally minor and in response to specific problems or hardware changes. The requirements process is conducted by NAVMAC and/or contractors and is heavily influenced by the existing personnel system. They do not operate with budget constraints and have little incentive to trade among types of personnel or between technology and personnel in order to reduce cost. The people with those incentives (the fleet and warfare community managers) don't have a direct role until the authorization process. By then, it's often too late.

Recommendations

Billet costs in the POM process can help create the right incentives. Setting prices by paygrade is straightforward.² To reflect the major differences in cost among ratings, the training costs for specific ratings should be included. Developing a single "best" approach for amortizing initial training costs over a career doesn't appear feasible. In this paper, we suggest some reasonable alternatives. If rating-specific prices are too difficult to calculate, then average prices by community (using historical data) can be a first step.

Accounting for full costs requires a surcharge on Manpower and Personnel, Navy (MPN) costs for those costs not directly in the MPN account. The size of the surcharge, and how it will be distributed, needs to be worked out.

The requirements process—an engineering standards approach—greatly limits the flexibility of resource sponsors. Giving them, and the fleets, a more active role in setting requirements or allowing them more flexibility to go outside the guidelines set by the manning requirements documents is necessary in order to take advantage of the benefits of a cost-based authorization system. A test case—either a paper exercise or allowing actual units more flexibility as a prototype—would indicate whether an unconstrained solution is significantly different from current rules.

2. Because the actual paygrade distribution is fixed in the short-run the possibility of gaming the system exists. Approaches to limit that problem need to be put in place.

Pricing billets

Decisions about where the Navy spends its limited budget are difficult to make in the absence of information about the costs of resources. Historically, the Navy has made the costs of military personnel explicit in the Planning, Program and Budget System (PPBS) process. Resource sponsors are charged a fixed price for each enlisted (and separately for officer) billet they authorize. This billet price is derived by dividing the total cost of the projected MP,N budget by the projected average strength. In total then, these prices will cover the costs of pay and allowances.

The other area in which the costs of billets are examined is in the systems acquisition process. The costs of personnel are often considered when new systems are assigned. This paper focuses on billet pricing in the POM process, but the implications for acquisition are examined when appropriate.

There are two types of problems with the billet prices used today. One is that they don't capture the full costs of supporting those billets. Adding a billet to an activity usually obligates the Navy to a whole series of costs not directly associated with the pay and allowances of that billet. The second is that the billet prices don't distinguish among different types of personnel. Different personnel cost the Navy varying amounts based on paygrade and rating.³ These two problems affect the decision-making process in different ways, and we address the potential responses to them separately.

Accounting for full costs

The costs to the Navy of adding a billet at a single activity may be much higher than the costs of pay and allowances for that billet.

3. In some cases, distinctions by NEC may be appropriate.

Associated with each billet is a significant support tail. This support tail consists of two elements. The first is the personnel required to support that billet. That includes personnel in the training pipeline who will eventually replace the current billet occupants, those assigned to conduct that training, and personnel to administer and operate the management and base support required for that billet. Sea-shore rotation also influences shore manning levels. Previous CNA analyses have examined the relationship between afloat manning and shore manning. They've found evidence of a fairly large support tail. One study [5] found that for every 10-percent change in manning at sea there was a 6-percent change in manning ashore (including civilian personnel ashore). Because there are more total personnel ashore, that translates into an increase of more than one billet ashore for every additional billet at sea. Another study [6] found comparable results looking only at military billets.

The second element of the support tail are those nonpersonnel costs associated with a billet. For example, there are operations costs to support bases (both training and homeports), medical costs, and housing costs that aren't fully accounted for in the pay and allowances associated with the billet.

Identifying the full cost of military personnel is important for making tradeoffs between personnel and other resources. These full costs need to be considered when making long-term or life-cycle decisions. Therefore, it's important that these costs be examined in the acquisition process, for example.

In the POM process, capturing billets required for shore rotation purposes isn't required. If a sponsor has to add additional billets ashore to support a sea billet, he pays for those billets as well. If, in the short-run, he doesn't buy those support billets, he shouldn't be charged for them. Nonpersonnel costs (base support O&M costs, for example) and personnel costs that must be borne by other resource sponsors may create some potential distortions in the price of personnel.

Accounting for differences across ratings and paygrades

Identifying differences in cost among different types of personnel is important to help create the right incentives in choosing among them.

Some personnel cost more than others, and prices ought to recognize that and encourage buying the best mix of personnel within a limited budget. There is anecdotal evidence that charging the same price for all personnel distorts decisions. Anecdotally, resource sponsors buy all the billets required in the most senior paygrades, then buy as many personnel in the lower paygrades as the budget allows. Because the senior paygrades are the same price as the junior paygrades, this makes perfect sense. It's the logic implicit in that story that led to the Navy's effort to charge different prices for different billets.

The costs of particular billets are not the only factors that influence what types of personnel are authorized and what types actually man the force. There are two other constraints. One is the personnel system that determines what types of personnel are available to be assigned to units, and the other is the Navy's requirements determination process that limits which billets can be authorized. In practice, these systems constrain the choices available to planners, and thus set limits on how much price flexibility should be allowed.

In this section, we discuss some of the alternatives for setting billet costs appropriately in a world with few restrictions. Then, we examine options for creating appropriate prices when choices are limited.

Setting prices in an unconstrained environment

Measuring the costs of Navy billets is a long-standing concern. The Navy has had several models that have tried to capture the full costs of billets. A recent effort to update those models provides a good starting point for creating billet prices [7]. The costs of billets vary because of differences in pay and allowances and because of other non-pay costs, in particular, the costs of training.

The purpose of current billet prices in the POM process is to create broad incentives and to establish a methodology to cover the full costs of the MPN account. Average prices don't distinguish among personnel, and the military personnel account doesn't capture the full costs of supporting Navy personnel. Separate prices by paygrade and rating provide more information to top decision-makers.

Tying pay and allowance costs to particular billets is computationally complex but conceptually straightforward. Relating non-pay costs to particular billets is not clear-cut, and several alternative methods are arguably acceptable. The following data display the differences in price information available when choices about which costs to include and how to relate non-pay costs to particular billets are altered.

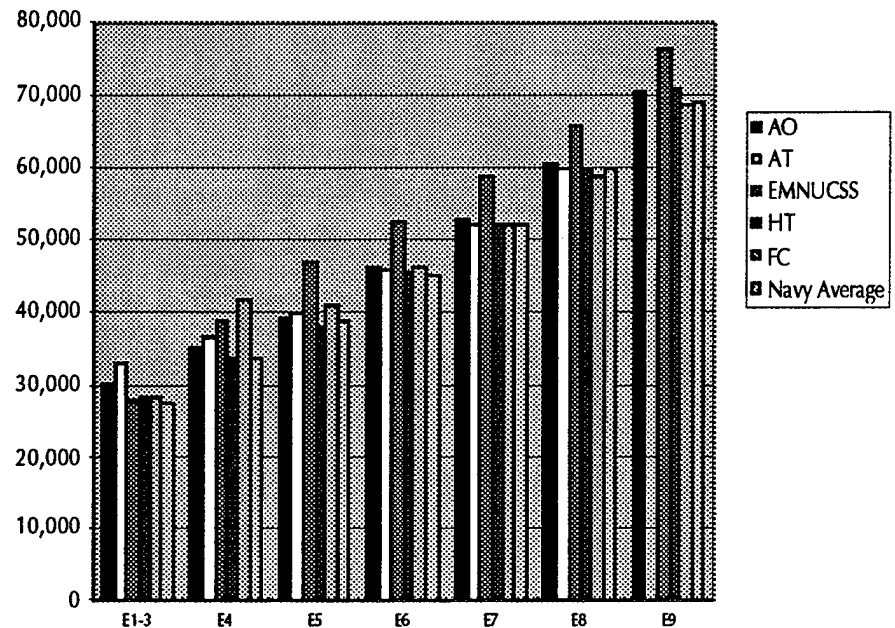
The data are derived from the newly updated billet cost file. To illustrate the underlying issues, we display data for five Navy ratings and the overall Navy average. We chose two aviation ratings: aviation ordnancemen (AOs) and aviation electronics technicians (ATs). ATs are a rating with relatively long training pipelines, whereas AOs have a shorter training requirement. We also selected two surface ratings with long and short training pipelines: firecontrolmen (FCs) and hull technicians (HTs). The last rating examined are nuclear-qualified submarine electricians' mates (EMs).

We start by examining differences in billet cost across ratings and paygrades using costs from the MPN account only. Figure 1 shows those billet costs. The figure indicates that the cost differences are almost entirely driven by differences in paygrade. At the E6 paygrade, the costs are all within \$1,000, except for the nuclear rating. The difference for the nuclear rating is largely driven by special pay differences.

Focusing on pay and allowances results in essentially treating all ratings similarly and only accounting for differences in paygrade. To create better incentives for decision-makers, it may make more sense to try to capture the full costs of personnel.⁴ Figure 2 shows the total cost of personnel across the selected ratings and paygrades (using the billet cost-file definition of total cost). This figure tells a different story than the first. In figure 2, there are substantial differences across ratings. At the E4 paygrade, for example, FCs cost more than \$25,000 per year more than HTs. There is a similar difference between ATs and AOs. The difference between the total cost calculation and the military personnel captures

4. In the POM process, the billet costs charged to sponsors are designed to cover the MPN account. If full costs are used to develop relative prices, then the costs need to either be rescaled so that on average they equal the average MPN cost or surcharges that need to be transferred to those activities (CNRC for recruiting, N4 for BOS, etc.) that have responsibilities imposed on them.

Figure 1. MPN by paygrade for five ratings and Navy average



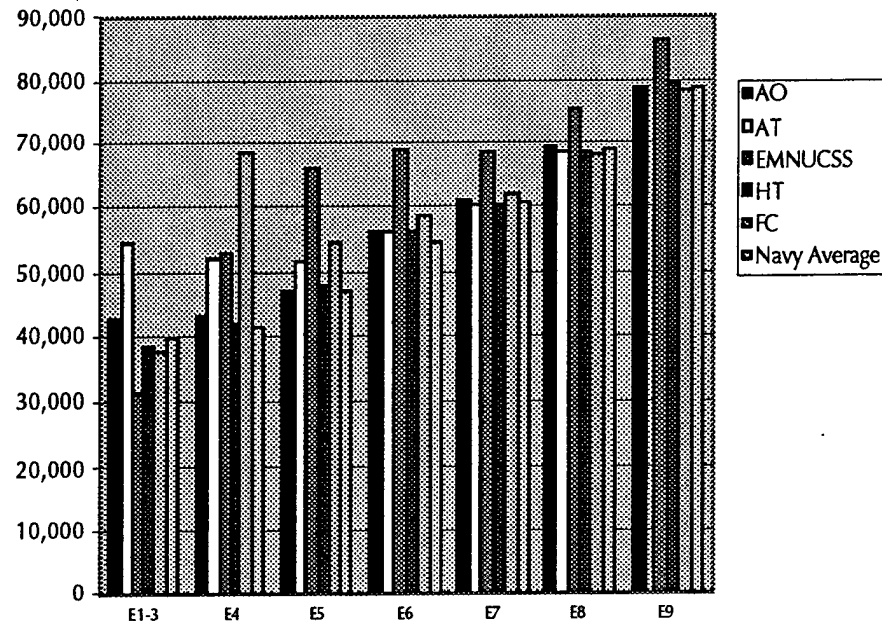
several costs (medical, recruiting costs, and others), but the largest component is training costs.

One oddity about the total cost data shown in figure 2 is that the non-pay costs are heavily weighted toward the junior paygrades. As a result, for example, the cost of an E4 FC is more than for any other paygrade except E9. By the E6 paygrade, the differences among ratings are greatly compressed again.

In a process that is designed to be used to create prices for alternative billets, these costs create potentially perverse incentives. One can see that a sponsor might avoid authorizing E4 billets, thereby avoiding the training costs associated with that rating. Alternative methods for allocating training costs can produce more reasonable results.

Apportioning one-time costs across a person's career is a difficult task. In a closed system, where senior personnel can only be obtained by accessing, training, and keeping junior personnel, it's not obvious how to calculate the cost of creating a senior billet. Adding that senior

Figure 2. Total cost by paygrade for five ratings and Navy average



billet requires either adding more junior billets or changing current retention rates. In either case, the cost of that billet is higher than just the pay and allowances that match that billet. The only accurate way to calculate the cost is to build a comprehensive simulation model that allows one to calculate the cost of the entire personnel system with and without the one additional billet. We probably don't understand the dynamics of the personnel system well enough to build this model. Even if we could, it is probably not practical to use such a model in real-time. For example, measuring the costs of adding two billets in a particular rating doesn't necessarily equal twice the cost of adding one billet. As a result, planners would have to estimate the complete model for every possible combination of billets under consideration. That's not a feasible approach.

What is a realistic approach then? To evaluate one-time costs such as training, it's necessary to make some reasonable assumptions to help spread the costs.

That's the approach taken in the current billet cost model, but the assumptions used lead to results that seem inappropriate. There are alternative assumptions that lead to cost allocation results that intuitively seem more reasonable. The model used in the current billet cost file weights the allocation of training costs by the continuation rate. If, for example, training occurs at paygrade E4 and the continuation rate to E5 is 50 percent, then the annual training costs attributed to an E4 billet is twice that of an E5 billet. That can, and does, lead to situations in which the total costs of junior billets are higher than more senior billets within a rating.

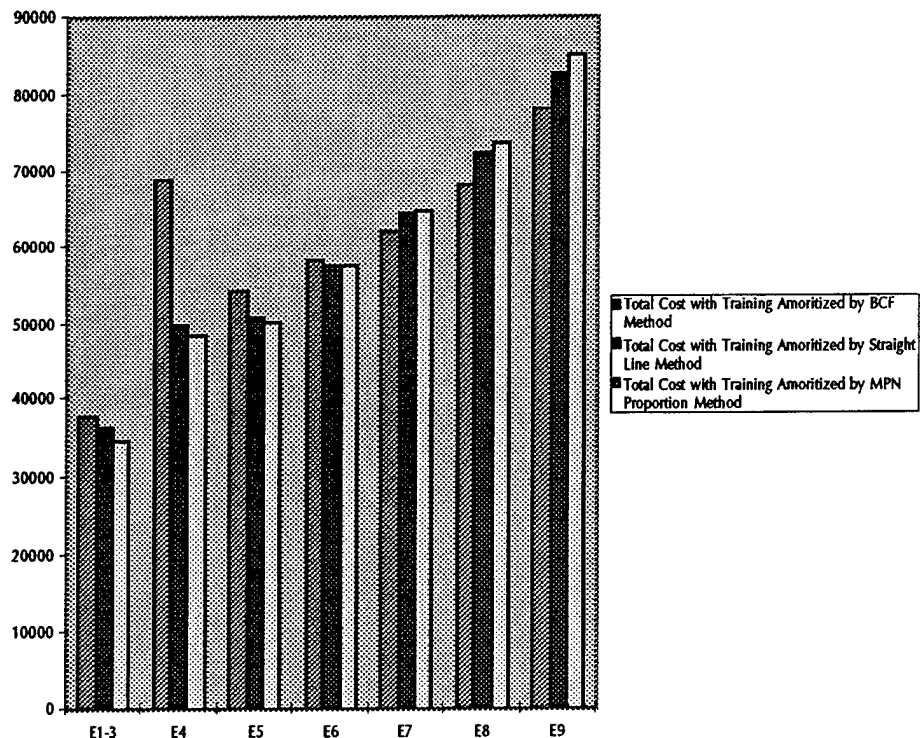
If we assume that the amount the Navy is willing to invest in training is roughly equivalent, on the margin, to the value of that training, we would expect that allocating training costs by the relative annual value of that training makes sense. How can we do that? Assume a simple case in which training is provided at year T and that the value of that training doesn't depreciate over time. Then the annual cost of training should be allocated equally in all years from T through the end of the career. If we calculate the expected career length of personnel in a rating from year T , we can simply divide the total training cost by the expected career length to obtain the annual training cost to be allocated.⁵

Another alternative to estimate the value of training by paygrade is to assume that training provides the necessary basis for someone to work in that rating—without that training, his marginal product is zero. The relative value of training is then weighted by the average productivity in that paygrade. In the past, we've used a person's pay as a proxy for productivity. In this case, the cost of training is allocated based on the expected career length but is also weighted by relative pay. This second model means that the allocation of training costs are higher in higher paygrades.

5. If one assumes that training does depreciate in value, it's relatively simple, for an assumed depreciation rate, to reallocate the costs. Assuming depreciation of training means that the costs would be weighted more toward the initial years after training than without depreciation.

Figure 3 displays a bar chart showing the total cost by paygrade for the FC rating for three methods of allocating training costs. First, it displays the methodology in the current billet cost model. The next bar shows the costs reallocated evenly across a person's career. The third bar allocates the cost weighted by actual pay. We would argue that the last two methods provide results that most decision-makers would find more intuitively appealing. They also seem to be more logically consistent.

Figure 3. Comparison of amortization methods



Setting prices in a constrained environment

We know that some billets cost more than others. We know, as a general rule, that users of services should see the full costs of those services. It's tempting then to assume that, in all cases, using prices that vary by billet and paygrade would increase the efficiency of the manpower allocation

process. However, there are constraints in the Navy personnel system that create situations in which it may not be appropriate to charge the true cost of billets.

Because the Navy has a closed personnel system where it grows its own senior personnel, the paygrade distribution tends to be relatively fixed in the short-run. If the paygrade distribution is fixed, then even if a sponsor chooses to eliminate a senior billet from its authorization, the billet savings are actually likely to come from recruiting or retaining one less junior sailor. If the sponsor is credited with the full "savings" from eliminating that billet but the actual savings are smaller, there will be a mismatch between money set aside for pay and allowances and what's actually required. This situation could create the wrong incentives for sponsors as they approach the execution year. The potential for gaming the system, to claim savings that don't exist, can be addressed. One option is to credit savings only at the average price in the execution year. Another is to require that any changes in the execution year be applied across the full POM.

In the long-run, though, we do want to charge higher prices for more senior billets. That provides the right incentives for users of manpower resources and also sends signals to the personnel system about what types of billets are required. Over time, the personnel system can adjust so that if a sponsor authorizes a different paygrade distribution, the personnel system can accommodate it.

Varying billet costs by rating can probably be accommodated fairly quickly. When authorizations for a rating change, the A-school course load can be adapted quickly, and thus the change in cost can be achieved fairly rapidly. That suggests that allowing prices to vary by rating makes sense in most situations. When varying price by paygrade isn't appropriate, it's reasonable to charge the average price by rating without considering paygrade.

One final approach is possible if there is concern that either the personnel system can't adjust the rating mix quickly or if we lack confidence in the ability to create rating-specific prices that reflect true differences in cost. That is to charge a different price by community. This would simply require using historical averages of the billet costs

across sponsors or specific communities. That at least avoids the potential problem of one sponsor subsidizing another's billets when overall Navy average prices are used.⁶

6. This may require a one-time adjustment in the budget authority levels of each community sufficient to allow each to buy its current manpower distribution.

Who decides?

Given that price information can help make decisions about manpower resources, who should make those decisions? In the current system, the platform sponsors have prime responsibility for those choices in the PPBS process. In the execution year, N1 plays a primary role. In this section, we discuss the possibility of shifting those decisions to other parts of the Navy.

Who should decide how many and what types of personnel to authorize for Navy platforms? There are two conflicting principles regarding this issue. One is that decision-makers should see a broad range of tradeoffs. The second, is that decision-makers at relatively low levels have the best information about their own resource needs and should be able to make resource allocation decisions without unnecessary interference by central managers.

Alternatives

The current resource sponsors do see a wide range of choices—manpower, logistics support, and acquisition. The one limitation they face is that they can't trade personnel across communities. Senior leadership can of course make resource decisions that cross sponsors.

There has been discussion in the past of centralizing decisions on manpower resources within the personnel management system. That process would allow resources to be more easily reallocated across warfare communities. That approach, however, greatly diminishes the Navy's ability to substitute between personnel and other resources.

It would eliminate (or greatly lessen), for example, the incentives to invest in technologies that reduce manning requirements by breaking the link between those investing in the technology and those who reap the savings.

The alternative to centralizing manpower resource decisions is to decentralize decision-making. Giving the fleet more flexibility to allocate manpower is consistent with this approach. The Army and Air Force give their major commands (somewhat comparable to the Navy's fleet commanders) a large role in resource decisions. Navy fleet commanders have oversight over many resources, but they play a less dominant role in both the programming and acquisition processes than do their counterparts in the other services.

Currently, the fleet commanders probably don't have enough staff to play a larger role in the programming process. Although the fleet commanders are closer to the manpower issues that face the operational units, they are still somewhat divorced from day-to-day decisions. In fact, the fleet commanders would probably lean heavily on the type commander staffs for most decisions. Ensuring consistency across the two fleets could be an issue in this organization. The fleet commanders do have the ability to oversee the process and to transfer resources across warfare communities.⁷

A more extreme example of decentralized decision-making would be to give ship (or squadron/submarine) commanders flexibility in defining the personnel they want. However, there are problems with this level of decentralization. Personnel on individual ships have tours that last about three years so this basically limits the flexibility of a commander to altering the personnel on his ship. By the time he makes the changes he wants, he is nearing the end of his command tour. Commanders already have a great many management responsibilities and adding additional manning decisions may not be a good idea. There is also the potential conflict between the objectives of an individual commander and the priorities of the fleet or unified commander. Fleet commanders need the ability to substitute among units, and consistent capabilities across units (implying similar manning) is important.

7. This was one of the arguments for creating the SHORLANT/SHORPAC staffs to oversee base support issues.

Conclusions

Under the current resource allocation process, the platform sponsors have the primary responsibility for determining manpower resources. That system puts the decision-making responsibility in the hands of an organization that is also responsible for most of the other resource decisions in that warfare community. That is a reasonable process.

The alternative that the Army and Air Force have chosen gives operational commanders more responsibility in making resource decisions. The Navy equivalent of that approach is to give the fleet commanders increased responsibility for manpower resources. That approach may be sensible, particularly if the fleets take on a larger role in other resource decisions as well. A change of this type would require major changes in Navy organization, and it would be warranted only if there were broader reasons for making the change. Potential improvements in manning decisions are unlikely to be enough to justify a change of that magnitude.

Requirements determination

The manpower allocation process charges sponsors for the billets that they authorize. The cost of those billets is one influence on the number and type of billets they choose. It's not the only, and perhaps not the most important, influence. The billets that sponsors are allowed to buy for their ships, submarines, and aircraft squadrons are tightly constrained by the billet requirements set for those platforms. Those requirements specify the number and types of positions that can be authorized. Sponsors can't authorize more billets of any particular rating and paygrade than are listed in the requirements document. In other words, a sponsor can't substitute an extra E7 billet for two E4 billets even if that substitution could increase readiness and lower cost.

The requirements guidelines limit the ability of sponsors to adjust manning authorizations to perceived changes in the cost or value of particular billets. If a sponsor wanted to authorize 100 percent of the billet requirements, the only feasible solution is to buy exactly the billets listed in the requirements document.⁸ Any change in billet prices would have no effect on the mix of billets that could be bought. In practice, sponsors authorize around 90 percent of the required billets which means that some choices can be made, but this flexibility is clearly limited.

Although the manpower requirements process has great influence over what billets are bought, it doesn't directly consider the costs of different types of personnel. The requirements determination

8. In the 1980s, the Navy experimented successfully with increasing the authority of local commanders to choose the mix of civilian personnel they found appropriate. This policy of "managing to payroll" gave managers substantial flexibility. Over time, some restrictions have been reinstated, however.

process is generally an engineering exercise and isn't specifically designed to make good business decisions for the Navy.

Billet requirements are determined based on observed (or estimated) maintenance workloads and watchstanding requirements. Both sources of requirements are calculated based on current manning policy and practices. The requirements determination process is not designed to look for improvements or to minimize the costs of accomplishing the unit's mission. As a result, the requirements process will tend to reproduce the existing paygrade mix. In fact, when the initial determination of the process is inconsistent with standard personnel rules of thumb, the requirements are adjusted to match the standard paygrade distribution.

That's not to argue that the current requirements process isn't valuable. The requirements process is systematic and reproducible. Previous CNA studies have examined requirements determination and suggested ways to improve the process, but, in general, the process is credible and serves as a starting point for thinking about how to man ships and squadrons. However, relying too heavily on the process limits the ability of the Navy to respond to changes in economic conditions.

For example, if changes in private sector market conditions caused an increase in retention rates (and reduced the relative cost of senior personnel), a cost-minimizing manager might want to increase the ratio of senior to junior personnel. The current requirements process doesn't allow changes in prices to influence the outcome.

It's been our experience based on past research and current discussions that fleet operators don't have the time or, in their view, the expertise to change billet requirements. The platform sponsors have some influence over requirements, but the changes they can make are generally minor and in response to specific problems or hardware changes. The initial requirements are set by the systems commands as part of the acquisition process. Once units are in the fleet, the requirements process is conducted by NAVMAC and/or contractors and heavily influenced by the existing personnel system. They do not operate with budget constraints and have little incentive to trade among types of personnel or between technology and personnel in order to reduce cost. The people with those incentives (the fleet and warfare community managers) don't have a direct role until the authorization process.

This paper focuses on buying billets—the manpower authorization process—and, in particular, how prices are set for billets. The requirements determination process strictly limits the choices available in the authorization stage. Creating more flexibility in the requirements stage and finding ways to let billet costs affect those decisions may be a fundamental step that is missing in the overall manpower allocation process.

Recommendations

Making the costs of alternative policy decisions visible is essential to making the right decisions. This paper has focused on the costs of military manpower. Setting billet costs in the POM process can help create the right incentives. Billet costs should capture the full costs of personnel so that choices among personnel and other resources reflect the true relative costs. Billet costs should also reflect differences in cost among different types of personnel.

What costs should be used in setting prices? The data examined in this effort suggest that focusing only on costs in the MPN account limits the ability of billet prices to capture the full costs of billets. Accounting for full costs requires a surcharge on MPN costs for those costs not directly in the MPN account. The size of the surcharge, and how it will be distributed, needs to be worked out.

Setting prices by paygrade is relatively straightforward. Setting prices by paygrade and rating is more difficult. In particular, to reflect the major differences in cost among ratings, the training costs for specific ratings should be included. Developing a single “best” approach for amortizing initial training costs over a career doesn’t appear feasible. In this paper, we suggest alternatives that have reasonable properties. If rating-specific prices are too difficult to calculate in the short-term, then average prices by community (using historical data) can be a first step.

Setting prices creates the right incentives only if decision-makers have the flexibility to act on those prices. The requirements process—an engineering standards approach—greatly limits the flexibility of resource sponsors. Giving them, and the fleets, a more active role in setting requirements or allowing them more flexibility to go outside the guidelines set by the manning requirements documents is necessary in order to take advantage of the benefits of a cost-based authorization system. A test case—either a paper exercise or allowing actual

units more flexibility as a prototype—can give some indication of whether an unconstrained solution is significantly different from current rules.

References

- [1] CNA Research Memorandum 92-226, *Analysis of the Navy's Commercial Activities Program*, by Alan Marcus, Jul 1993
- [2] CNA Research Memorandum 94-65, *Issues Concerning the Public and Private Provision of Depot Maintenance*, by John D. Keenan et al., Apr 1994
- [3] CNA Research Memorandum 95-196, *The Defense Business Operations Fund (DBOF): Problems and Possible Solutions*, by R. Derek Trunkey and Jino Choi, Mar 1996
- [4] CNA Research Memorandum 88-95, *FFG-7 Class Manning Study Final Report: Manpower Requirements Analysis*, by David M. Rodney, et al., Feb 1989
- [5] *Some Evidence on How the Navy's Manpower Ashore Varies With Manpower at Sea*, by Samuel D. Kleinman, Jul 1991
- [6] CNA Research Memorandum 95-203, *Some New Estimates of the Navy's Costs*, by Henry Eskew, Dec 1995
- [7] Navy Billet Cost Factor: Cost Estimation Model, Version 1.0, SAG Corporation, Apr 1995

Distribution list

Research Memorandum 95-222.10

SNDL

A1H ASSTSECNAV MRA WASHINGTON DC

A5 PERS-2

A5 PERS-5

FJA10 NAVMAC MILLINGTON, TN

OPNAV

N4B

N80

N801D

N80D

N813

N81D

N82B

N869

N879

N889